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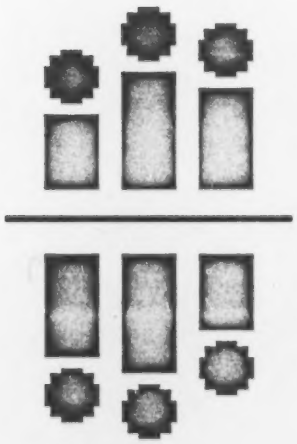
EDUCATIONAL TECHNOLOGY: INFORMATION NETWORKS, MARKETS AND INNOVATION

PART IV

Survey of Four Firms
Involved in Both
Educational Software and Business Products



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W. Curtiss Priest, Director
18 Whipple Rd.
Lexington, MA 02173
617-862-7763

Part I — *General Framework on Markets, Nonprofits, Patrons, and Policy*

Part II — *Information Networks: The Diffusion of Innovation and Highlights of Discussions with Eighteen Networks of Teachers, Administrators, State Coordinators and Other Information Providers*

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Part V — *Reference Materials: A Comprehensive Bibliography on Educational Technology, Innovation, Adoption, and Policy* and Appendices

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SURVEY OF FOUR FIRMS INVOLVED IN BOTH EDUCATIONAL SOFTWARE AND BUSINESS PRODUCTS

INTRODUCTION

One way of examining market failure is to contact firms that have products in both the education market and the business market. Principals of these firms would be in a good position to instinctively compare the two markets based on their firm's experience. This approach complements the study of ten firms involved in educational software by providing a comparative perspective. The four firms are McGraw-Hill, Broderbund, IBM and Apple Computer.

There are very few firms that are involved in both markets and there may be a lesson just in that. IBM has been in and out of educational markets since the early days of the PLATO project at the University of Illinois. This survey catches IBM at a point where they are again putting a large effort into the educational market. McGraw-Hill is a wide range purveyor of information products and services including business data through Data Resources Inc., business information through *Business Week*, and business oriented timeshare services. They have textbooks both for education K-12 and for the science and engineering market in general.

Broderbund is a newcomer to both markets. They primarily represent a situation where their products were found useful to both markets. And Apple Computer is an interesting case of a firm somewhat outgrowing its earlier education market roots and is head-to-head with IBM in the microcomputer business market.

THE SURVEY OF FOUR FIRMS

Unlike the study of 10 educational software firms that employed an extensive questionnaire, the survey used only an introductory question when the respondent was called. The interview began with an introduction to the Congressional study that stated that Congress and OTA were interested in what government role there was in educational software markets? The introduction went on to say that it was felt that firms that served both educational and business markets could compare and contrast these two markets, and would they comment on that?

For each of the four firms, a person of sufficient stature and scope was identified so to make the comparison significant. At IBM this was difficult as there were some management people in the

Educational Systems Division that were less able to address the educational market. After discussions with the general manager, Mr. Jim Dezell, and a strategist, Mr. Ken Manning, the best contact person identified was Dr. Peter Dean, Manager of Courseware Requirements. At McGraw-Hill the contact was Mr. Robert C. Bowen, Executive Vice President for Educational Pulbishing and Training of the McGraw-Hill Book Company. The contact at Broderbund was Ms. Diane Sipes, Vice President for Marketing, and at Apple the contact was Mr. David Baram, Vice President of Finance and Corporate Affairs.

SUMMARY

The four interviews make for four different and interesting stories. The two firms that have been staunchly in the educational software and computer area (McGraw-Hill and Apple Computer) both agree that the school market is tough and sends out very weak market signals for computers and educational software. Broderbund has been dependent on the consumer retail market and is only recently exploring educational software ernestly but cautiously. It has been the overlap of the tools they have developed for the home market to the school market that has brought them success in the school market. The "new kid on the block" in terms of today's education market is IBM. Their expectations of the market are almost unbelievable and only time will tell if this optimism about the strength of the market is right.

HIGHLIGHTS OF INTERVIEWS WITH FOUR FIRMS IN EDUCATIONAL SOFTWARE AND BUSINESS PRODUCTS

McGraw-Hill Book Company — Mr. Robert C. Bowen, Executive V.P. for Educational Publishing and Training

There is a "real difference between educational and business markets." In the case of educational software, the size of the pie is already determined by the allotment for textbook money, and expenditures for software are expenditures that are often taken from textbook money.

Teachers are demanding that software be part of the textbook system at "nominal fees above the costs of textbooks." They are simultaneously demanding high quality and innovative software

for problem solving and higher-order skills. They cannot have both.

"No one is really making money" in the educational software business except in business education. [Note: McGraw-Hill like many other textbook-software publishers do not operate their school software business as its own profit center.] They see their software developments as "adding value to their print products."

Federal funds are useful in providing people with experiences. It would be good to form consortia to do development and demonstration with efforts from universities, school systems, and private industry. One activity they are engaged in is to have an on-line computer teleconference for teachers. Their EMS division in Minnesota under Gary Morteniser provides this service and it has been used for summer institutes in California [Note: New York Institute of Technology has been using computer teleconferncing for their extension courses for a number of years.]

Their recent experience with the NSF science curriculum program was unsuccessful. They had discussed a large undertaking of a new K-8 science series where $7 million would be provided by McGraw-Hill for the textbook part and $5 million would come from NSF. They had proposed the cooperation of three universities (Vanderbilt, Univ. of Huston, and Univ. of North Carolina) to include technologies including videodisc and four geographically dispersed school systems. While NSF had originally encouraged such a large proposal it was not funded with the concern that it 1) would use too much of the program's funds and 2) was too textbook oriented. Nontheless, it takes from $5 - 7 million to develop a basic science K - 8 textbook program. A K-8 reading series with over 300 pieces (textbooks, workbooks, etc.) costs $20 million to develop. NSF's awards were relatively small – from $100,000 to $1,000,000. But to impact elementary science education one really has to impact the text book. They felt the review process was one they always used for small grants and wasn't fair to the proposed effort. The peer review process "has a life of its own" [See the section of this report on patron failure – problems with peer review.]

McGraw-Hill feels if the aim is to really impact education the approach must be comprehensive and a number of small chips will not succeed.

In terms of leadership they respected the National Commission on Excellence in Education's *Nation at Risk: The Imperative for Educational Reform* [1983] and the Technology Task Force put together by Secretary Bell before he was replaced by Secretary Bennett [see Ridley, 1986, also see a critique of the taskforce, Braden, 1986]. Unfortunately the recommendations had "no teeth." Bowen sees the need for not permanent funding but something for say 3 years that could really make a difference in the type of software. Secretary Bell actively pressed publishing companies to do something for computers and education in contrast to Bennett.

Broderbund Software — Ms. Diane Sipes, Director of Marketing

They entered the business via the home consumer market 7 years ago primarily with games. It is this market that is still their primary target. Thus, they licensed Bank Street Writer from Bank Street College primarily for the home market though they sell into "the low end" of the school market.

Their popular product, Print Shop was produced for the home market and is not meant to be competing with more powerful layout packages. It is useful for someone with an Apple or IBM computer to put out greeting cards or banners. Schools have adopted it as a learning tool.

Their most popular school package is the *Where in the World is Carmen Sandiego?* series which is a combination of mystery and a geography game. They marketed this to the consumer market in retail stores and it was the teacher who discovered it and adopted it for school use.

They do not develop with curriculum areas in mind, rather they develop tools or software to aid thinking skills. [Note: Broderbund has put out a colorful catalogue of their software oriented to introducing the school market to their products. The first section highlights the *Where in the World* ... series, the next section shows their science tool kit which turns computers into measurement instruments, the next section shows three programs that provides basics of physics, geometry, and calculus, the next section shows products to help improve writing organization and managing finances, and the final sections show their programs to help do certificates, drawing, and art.]

They emphasize a limited selection of "high quality software so they stand out from the crowd." The science tool kit, for example, is adaptable to a teacher's interests and though they suggest possible experiments, it is not prescriptive.

Business is their number 3 market and they have a notepad facility called ForComment and a file system called Memory Managment.

It is the home market that they view as their stable supporting market. They see a greater installed base in business with greater profits and larger development costs. It is always necessary to sell something in the education market for less money.

Again they never targeted the school market directly and are only now sending their new catalogue to schools. To help schools teach with their software and finance multiple copies they have announced "New School Editions" with teacher guides and "Lab Packs" that reduce the per copy cost. They are providing 30-day preview to the schools and are just now accepting school purchase orders [Note: school purchase orders are about the only way a school procures software.]

This year they are developing products for both the home and school markets.

The software on specific subjects such as geometry, etc. (described above) is actually not their development but that of a firm called SENSEI Software and they have become a distributor for them.

They are not interested in going into drill and practice and will expand around the existing product base. They are a fairly small company with about 100 professionals, with annual sales of around $24 million, and are very selective about what they develop.

They definitely sense the budget limitations of teachers and that they "watch every penny." Their software is all copy protected and they provide a back-up disk for schools. They are definitely concerned about the problem of illicit copying.

IBM Corporation — Dr. Peter Dean, Manager of Courseware Requirements

There has always been an Education Industry Marketing Team within IBM. The current focus of activity, IBM Educational Systems, was formed in the Spring of 1985 after considerable internal discussion. In late 1984 there were three groups that were vying to manage the educational efforts and each made business presentations that went up through the division level, the group level, and the board of directors. The divison in Wildwood prevailed over the other inside competition in establishing a "business unit." Other activities at IBM such as the Entry Systems group in Boca Raton, FL are now coordinated through IBM Educational Systems.

There was an extensive business plan presented for the effort and the most compelling market argument to reenter the educational market in a substantial way was on the success and growth in sales of firms such as Apple, Radio Shack, and Commodore.

There was recent trouble to overcome since the previous low-end microcomputer was the IBM PCjr which was finally taken out of production. (Rosenberg [1987] cited problems with the keyboard for wordprocessing, a rarely used game cartridge, and the absence of other options.) IBM announced in June (1987) a low-priced entry of their IBM PC for home and school use — the Personal System/2 Model 25. With discounts up to 40% for schools, the basic model with one 3 1/2 inch drive and a monochrome screen will cost as low as $810. A network model (model 60) is also available. In announcing the new product, IBM chose 15 of the top educational software companies to present the product and encouraged third party software development. IBM, however, has (unlike Apple Computer) been developing software explicitly for education. Their Fall, 1986 catalogue shows 25 programs in reading/language arts, 16 programs in math, 9

progams/products in teacher tools/networking, 39 programs in science, 18 programs in computer literacy, and 15 programs in business education.

The Educational Systems Division is preparing for a large assault on especially the larger school districts in the country. IBM has assigned marketing teams to the largest 200 school districts (the largest 169 districts cover 77% of the school market according to TALMIS, Washington, DC). They have also assigned a marketing representative to the next largest 4000 school districts out of the total of 15,139 school districts [Market Date Restrieval, 1987]. Each market representative has from three to five accounts and operate out of the IBM sales branches under the direction of the branch managers. It is the branch manager that sets priorities for sales efforts and is also covering other public markets such as local and state government.

The districts are divided into two categories — those with a plan for computer utilization and those without. IBM is especially looking for the districts that will place $ 1/2 million orders or more. IBM's approach very much focusses on the district administration where the role of a teacher is at most to exercise their "pocket veto." The way a district proceeds is to say first provide students with enough time on computers for math in 4th grade . . . then 5th grade . . . then 6th grade, and then push down on a plan where the life of the machine was estimated as 5-6 years. In districts without a plan they work with the superintendent or the education board.

Regarding school budgets Dr. Dean is confident that schools can find the funds if they are convinced it is worthwhile, sometimes through bonds or with a tax override in the locality. He noted that the current budget on computers is 1/4 that spent just on school buses alone.

Dr. Dean noted that earlier computer systems involving mini's or mainframes were too expensive for schools. The $5/hr. cost per student was not within the market.

IBM Educational Systems is targeting three general education markets: K-12 and literacy, Post-secondary – non-degree vocational, and special needs. Efforts before the formation of this division were done more on individual initiative such as the support of Seymour Papert's work at the Hennigan School in Boston was by a division on architecture at Austin, TX.

One effort in software development is they are paying some of the publishers to translate software designed for the Apple over to the IBM PC. They are number two in placing hardware in the schools already according to a market volumes survey by the Software Producers Association. This year they expect they will be first but this still is small in terms of the total percentage placed in schools. By working with the top 15 software publishers they estimate they have covered 50% of the software market (TALMIS estimates that 60-70% of the software market is covered by the top 25 educational software firms.)

Dr. Dean notes that it can be painful to be too early in the market such as Texas Instrument's debacle with the TI-99/4. It has been necessary for schools to see computers as "an object of study" and he is glad to see the concern for "literacy" almost over. The focus now is on the computer as a tool and schools are very involved with wordprocessing and spreadsheets. He sees us past the period when mothers would organize a bake sale to raise money for a few Apple IIe's and where computers were treated as "a reward to play on if the student was good."

We are in another transition which could be massive and could take place in the next 2-3 years or the next 8-10 years depending on circumstances. No matter what, however, computers are becoming an "integral part" of the schools. We are also in a period where computers are no longer being viewed as an adjunct to curriculum such as the library but as an integral part of the classroom along side textbooks and tapes. He further sees increases in networking and sophistication as behavioral objectives are set and systems keep track of students' mastery of skills. Schools are now well aware of the increases in student performance with the one-on-one impact of the microcomputer.

Regarding inservice training, there "can never be enough." They are funding a California university right now to develop exemplary courseware to help integrate methods courses, say in the teaching of reading, with computers [Note: this is certainly an effective way to promote IBM's write-to-read program.] Also, it may be useful by the government to provide low interest loans to acquire computers and software especially for the small districts.

They have been participants in the NSF program in software development for the teaching of science. Of the recent awards to Biological Curriculum (BSCS), Education Development Center, TERC, etc., they are the marketing partners with BSCS and TERC. They had also provided prior funding of BSCS's development work.

From Dr. Dean's perspective, the national problem of the government not separately funding development is to end by with "a national curriculum by IBM" — that the market becomes one in which "only the IBM's can play."

There is the conviction that these systems will make a difference in our national competitiveness and Dr. Dean cited a project at the University of Utah where Spanish as a second language was taught by combining Educational TV with computers with voice cards so that the passiveness of TV was overcome.

[Note: the reader is reminded that "can-do" tone of the interview is particularly characteristic of IBM's approach to markets and does not necessarily reflect the economic realities. There are people even at IBM who do not share the same sense of the market according to TALMIS. While

IBM has successes in the business education uses of computers they have not the experience of the more veteran firms in the educational market. It will be interesting to look back ten years from now to see if, indeed, the educational market can be assaulted à la IBM style.]

Apple Computer — Mr. David Baram, V.P. of Finance and Corporate Affairs

It has now been four years since Apple brought in John Sculley from Pepsi Co. to preside over Apple Computer. In that time Apple sales have gone from $982 million to $2590 million with strong support from the Macintosh that has penetrated the desktop publishing field and other business applications. The most recent additions allow the new Mac SE and Mac II to run software written for the IBM-compatible personal computer, and another add-on allows the Mac II to communicate in Digital Equipment environments on *Ethernet* local area networks. The recently announced multi-tasking operating system and *Hypercard* (a language environment that integrates a relational database environment with graphics and external devices such as videodisc and CD-ROM) both expand the versatility of the Macintosh.

These developments, however, have not focussed on the school market but rather the business market, and Mr. Baram says the K-12 market "won't send much of a [market] signal" to a computer firm like Apple. [Even at Apple's peak in percentage of computer sales to the school market, that percentage was only around 25% according to a spokesperson at TI.] A computer firm cannot justify very much development just on the school market. It takes other, stronger markets to encourage development and innovation and the results will "spill into" the educational market eventually. (One spokesperson for a 3rd party firm, MacroMind, Inc., has gone so far to say that Apple doesn't want Macintosh's in schools to avoid having a "school machine" stigma.)

Apple's basic philosophy has been and continues to be to develop the right tool for the individual. For education purposes, there is a much stronger market signal coming from corporations or government for training of personnel, for example, the army or the 3M Corporation. They continue to operate the Apple Classrooms of Tomorrow around the country as research but this is not seen as a dominant activity. Today, at least computers like the Macintosh are "still way to expensive" for "the limited resources of schools."

Regarding IBM's thrust, they recognize that IBM is very good at marketing but "it is really difficult to jump" into that market. IBM has made inroads on the administrative side and they are well positioned for the audio-visual interface,

Asked whether the school market was being forsaken? Schools "don't have today the resources." "This is a fact of life" and they will have to "wait until the price comes down due to volume or when the productivity is worth it."

Apple is pleased with the contributions they have aided in the school market with the introduction of the IIgs computer. One 3rd party software package called Music Studio provides a visual environment to write music, using the mouse and a staff, with different instruments playing different notes, and the sound is "outstanding." It will take lots of teachers to figure out how to use new computer tools to work for educating kids — its the "infancy of the animal."

When asked whether the Congress should promote "information literacy" he thought that was a good goal.